Supplementary file 1 – Matrix of evidence utilised in developing the provisional messages for Stage 2, phases 1 and 2 patient interviews

Draft messages Developed in HPV Core Messages Study (marked *) or added following expert group discussion to address non-cervical cancers	**Qualitative interview & postal survey evidence For messages developed in HPV core messages study**	**Systematic review evidence from core messages study Underpinning evidence from a review of reviews ---------- Evidence of information needs from reviews of views on HPV vaccination and testing**	**Evidence from other published sources Identified in the 'Talking about HPV' systematic review, or targeted searches, or by members of the expert group**	**Telephone interviews with healthcare professionals Summarised comments and illustrative quotes**	**Provisional messages after expert group review**
HPV is very common; most sexually active people will have it at some point in their life.*	Most women in the NHS cervical screening programme HPV pilot sites who were interviewed said they had been unaware of HPV prior to their results letter. Only 9.2 % of the public and 37.3% of healthcare professionals surveyed thought the statement, "Most people will get an HPV infection during their life" was true. 6.1% of the public and 2.5% of healthcare professionals believed HPV infection to be rare.	The prevalence of HPV in the USA ranged from 14% to more than 90%.[1] The estimated global HPV prevalence in women with normal cytological findings was 11.7%.[2] ---------- Few knew HPV is highly prevalent.[3]	Nearly 3 out of 4 people between the ages of 15 and 49 have been have been infected with HPV at some point in their lives.[4] Most of us will acquire a HPV infection at some point in our lives, usually without knowing about it. Telling patients this, and being inclusive, will help them feel that HPV is 'normal'.[5] Most sexually active people will get HPV early in their lifetimes.[6]	Clinicians explain to patients that HPV infection is very common and can take years to develop, but often seek to avoid emphasising the sexually transmitted nature of the virus. "It is as common as having a cold" "I explain that the virus is like the flu virus in terms of it is a virus and that pretty much all of us can get it...I hardly ever say that it is sexually transmitted unless they bring that up. "We try and say to them it is a virus that's sexually transmitted but not in a way to make them feel they have done something wrong…" "I tell them sex is a healthy thing and that most of us are carrying it (HPV) – so they don't feel dirty"	**1. HPV is a very common virus that most sexually active people will be exposed to at some point in their life.**
HPV is just as common in men as in women.*	In interviews, parents of vaccination-aged girls were unsure of the value of the vaccination programme of boys were not to be vaccinated to help stop the spread of HPV.	HPV infection is highly prevalent in sexually active men and can be detected by a variety of specimens and methods.[7]	Partners tend to share HPV…[6]	"A lot of men carry it but it's not like having chlamydia"	**2. HPV is common in both men and women and is often shared between partners.** *Deselected after consultation with expert group*
Some types of HPV are 'high risk' and can cause abnormal cell changes that could lead, eventually, to cancer.*	"High-risk" was not a term used by interview participants – the consideration is that protection is offered against the viruses that cause cervical cancer, not that there are other HPVs that are not linked with cervical cancer.	---------- The term "high-risk" was poorly understood; some women associated it with risky behaviour.[8]			
Infection with HPV types that can cause *cervical cancer* can also cause other	Women interviewed in the NHS cervical screening programme HPV pilot sites questioned whether cancers other than cervical cancer	The review suggests that HPV is a risk factor for some head and neck cancers.[9]	'Most cancers of the vagina and anus are likewise caused by HPV, as are a fraction of cancers of the vulva, penis, and oropharynx. HPV-16 and -18 account for about 70% of	Patients ask about the other risks of HPV exposure and that other cancers can come as a result of HPV.	**3. Infection with certain HPV types causes all cervical cancer,**

cancers such *as penile, vulvar, vaginal, anal and head and neck*.*	can be caused by HPV, particularly whether men are more at risk from other HPV related cancers.	The overall HPV prevalence was 25.9% in head and neck cancers.[10] Oral infection with HPV is a significant independent risk factor for oral squamous cell carcinoma.[11] The direction of effect observed was towards an increased risk of laryngeal squamous cell carcinoma when HPV was detected.[12] --- Some women questioned whether HPV can cause other cancers.[8]	cancers of the cervix, vagina, and anus and for about 30–40% of cancers of the vulva, penis, and oropharynx.'[13] Estimated annual new HPV-related cancers globally: 10,500 penile; 27,300 anal; 19,960 vulvar and vaginal; 529,800 cervical; 60,000 head and neck[13-17]	"It's bad enough saying you contracted the virus via your cervix, but via your mouth is a bit much sometimes." "It may come up (in the case of females) that they have had cervical screening and that the virus that has caused the change in the cervix has done the same in the anus." "For cervical cancer it's acknowledged about sexual activity, that it is the HPV virus but anal, vulvar and vaginal cancers have not had that opportunity. Head & Neck has become more relevant now that it's been associated with HPV infection and also with better prognosis, so you're giving people potentially useful information whereas in anal cancer is it useful to give information around this as standard or are we just raising another issue which doesn't really help them?"		**almost all anal cancer and can also cause some other cancers such as penile, vulvar, vaginal, and head and neck**
HPV can usually be cleared by the immune system but occasionally, it stays in the cells *of the cervix* for several years. This persistent infection can cause the abnormalities that could lead to *cervical* cancer.*	There was poor understanding of how an HPV infection can lead to a cervical cancer. Simple and clear information was wanted, by Healthcare professionals and women who were HPV-positive, about the process of development of cervical cancer. Only 4% of members of the public surveyed believed the statement "HPV infection usually goes away without needing treatment" to be true, compared with 35% of healthcare professionals.	HPV persistence was consistently and strongly associated with CIN2-3.[18]	A healthy immune system suppresses the virus in most infected persons.[6] The vast majority of HPV infections are transient and most healthy individuals will effectively clear the virus. However, there may be significant person-to-person variability in the time required to complete viral clearance. In most people, HPV is cleared within a year or two.[19 20] Oral HPV infections… were as likely as cervical infections to persist to 6 months.[21]	Clinicians explain to patients that most people's immune systems will get rid of HPV within a year or two. "It is quite difficult to explain to people that you can go decades between getting infected with the virus and these cancers happening is quite a lot for people to get their head round." "The important message to get over to patients is that we are all exposed to viruses during normal sexual or social interaction and that their immune system has not knocked this one out...and a whole series of things have happened since which have led to you having a tumour."	**4.**	**HPV can usually be cleared by the immune system but occasionally, it stays in the cells of the affected area for several years. This persistent infection causes changes in the cells that may lead to cancer.**
Even if HPV causes cells to become abnormal, it usually takes up to 10 years for *cervical* cancer to develop.*		--- A few women were concerned about the length of time between HPV infection and cervical cancer developing…. Information that the transition from HPV infection to cervical cancer was slow was an	Progression from mild to severe dysplasia was at a constant low rate of 1% per year for up to 10 years… At 2 years, 29% of mild dysplasia was still present or had progressed. Progression from mild to moderate or worse was 11% (95% CI = 10%-12%) in 2 years. At 10 years, over half of the women with either mild or moderate dysplasia had not progressed to a more severe lesion.[22]	Clinicians explain that HPV can stay in the body dormant and not cause problems for years and years. "I told a patient that he may have picked up this infection 10-20 years ago and that everyone is exposed to it. He started crying and said he was glad I had told him about it because his wife was blaming herself that she gave him this cancer...."	**5.**	**Even if HPV causes cells to change, it can take an average of 10 to 15 years for cancer to develop.**

		important actor which reduced some women's anxiety.[8]	The natural history of oral HPV infection mimics that of genital HPV in general.[23]		
You get HPV from having sex or intimate sexual contact with another person.*	Large numbers of survey respondents in the public and professional groups (91.6% and 70.7% respectively) believed the information that HPV infection can be transmitted through any intimate genital contact was an important message.	---------- Some women expressed surprise at the information that HPV could be passed by skin to skin genital contact.[8]	HPV fact sheet: HPV is spread from one person to another during sex and skin to skin contact.[4] The virus is… transmitted via contact with infected body areas. This includes vaginal, anal and oral sexual behaviours.[20] Possible modes of transmission include oral-genital contact, oral-anal contact, and oral-oral contact.[19] HPV is very common and can be transmitted through vaginal and anal sex. However, oral sex, kissing, and genital-to-genital contact or genital-to-hand-to-oral contact can also allow for transmission to occur.[6]	Clinicians find it hard to explain about the sexually transmitted nature of HPV infection, and worry about causing patients distress and worry. "..Finding out it is sexually transmitted is going to be upsetting for them – with connotations of feeling guilty about previous relationships, or angry at their partners." "I don't want to go down the route of telling the patient it is to do with sexual transmission because it can open a huge can of worms. It's like HIV, herpes etc. – because they don't know enough about it." "The hardest thing to explain is that it is a sexually transmitted disease but it's not the same thing as having Chlamydia. Worries they don't understand." "Even if they only have a single partner throughout their life, they can still have HPV and then it would open a can of worms."	**6.** **You get HPV from having sex or intimate contact with another person.**
Although it is a good idea to use condoms to protect your sexual health, they do not provide complete protection against HPV.	In interviews with vaccination-aged girls and their parents, some parents who declined the vaccine believed that barrier methods of contraception offered as good a level of protection against HPV as the vaccine.	Among 27 estimates from 20 studies, there was no consistent evidence that condom use reduces the risk of becoming HPV DNA-positive.[24] ---------- Some women asked questions about the ability of condoms to protect against contracting HPV… Others assumed the condoms would be effective (as they are against STIs in general).[8] Some thought condom use negated the use for a vaccine.[3]	HPV fact sheet: Condom use does not totally protect against HPV.[4] … if HPV is present on uncovered skin or non-genital mucosal sites such as the oropharynx, transmission is possible… Clearance of HPV and regression of HPV-associated penile lesions and CIN has been reported with consistent condom use. However, this recommendation may not be practical for individuals in long-term, monogamous relationships, or relevant to HPV infection in the oropharynx.[6]	There is debate whether condom use actually makes any difference; but you can't say to a sexually active women that no, don't do this. "Wearing a condom makes no difference, it doesn't give any more protection."	**7.** **Although it is a good idea to use condoms to protect your sexual health, they do not provide complete protection against HPV.**
There is no way of knowing when you got HPV or who you got it from.		HPV infections clear within 2 years in more than 90% of individuals.[25-27]	"…something I did 25, 30 years ago came back to haunt me… "I wanted to find out who the heck it was who gave it to me."[28] …there is a significant "latent period"… which makes it impossible to define when, where and from whom any individual acquired a high-risk HPV.[20]	The main issue is that people might start blaming themselves. "The important message to get over to patients is that we are all exposed to viruses during normal sexual or social interaction and that their immune system has not knocked this one out...and a whole series of	**8.** **Most people never know they had HPV because there aren't any symptoms so there is no way of knowing when you got**

			It is important to tell patients that a diagnosis of OPC does not suggest recent HPV infection, that exposure may have occurred many years before, and that a diagnosis does not suggest recent infidelity, either on the part of their partner or themselves.[5] It is impossible to know for certain from whom or when one initially acquired HPV because most people do not know they have it.[6]	things have happened since which have led to you having a tumour." "It is very likely that their partners also have it, not necessarily through them." "..so it's the last thing he's going to do is tell is patients it's their previous sexual activities which caused this…it can open a huge can of worms…"	**HPV or who you got it from.**
Having a diagnosis of HPV-related cancer doesn't mean you or your partner have been unfaithful or promiscuous.			The patient may have been exposed in another relationship months, years, or decades earlier, and the infection may have been dormant ("hidden") in the meantime.[6] It is important to remind patients that being diagnosed with HPV-OSCC does not imply that either partner was/is unfaithful…. Or that either partner has a "risky" sexual past… Although HPV-OSCC is associated with sexual behaviours and a higher number of sexual partners… it only takes one partner who is infected to acquire the infection.[19] Because HPV is a common infection and usually acquired early in life it doesn't imply infidelity or promiscuity; there should be no shame or blame associated with it.[6 19]	Care must be taken not to imply that it's the patient's fault and that they were promiscuous when they may well not have been. Having the virus does not necessarily mean that you have had lots of sexual partners. "It is a marker of sexual activity not sexual promiscuity" "The younger ladies think it's associated with promiscuity whereas the older ladies tend not to ask anything." "Did I give it to my husband, or did he give it to me? One patient was distraught having been told that he had given it to his wife, or vice versa."	**9. Having a diagnosis of HPV-related cancer doesn't mean you or your partner have had sex with someone else.**
You can get infected from one sexual experience, but you are more likely to get HPV the more sexual partners you have and the more partners they have had.*	Nearly all of the members of the public surveyed (98.8%), and half of the healthcare professionals (54.4%) believed the statement "Having many sexual partners increases the risk of HPV infection" to be false.	HPVs infect epithelial cells in genital mucosa (alphapapillomaviruses only), oral mucosa or skin (representatives of all five genera)[29] --- A common belief was that girls or women only contracted HPV if they slept around.[3] A few acknowledged that a partner's sexual history was relevant… In studies of women who had been tested for HPV, the underlying concern about disclosure centred on embarrassment and shame about the promiscuity attached to an STI and the fear of being sexually rejected… Some participants expressed anger	Risk factors for HPV-positive OPSCC include specific sexual behaviours related to numbers of oral (>5) and vaginal (>25) sexual partners.[30] As with all other sexual behaviours, safer sexual practices and fewer sexual partners may be considered the mainstay of prevention.[6] Female HPV prevalence and acquisition have been positively associated with women's estimates of their male partners' lifetime number of partners or not knowing a male partner's prior sexual history.[31] It is clear that major risk factors for acquiring genital HPV involve sexual	Clinicians explain that you only need one sexual relationship to be exposed to HPV, although risk factors are multiple partners or starting sex life at a young age. "In effect once is enough" I will explain that there has been an association with people who have multiple sexual partners or that homosexual practices have been associated with HPV.	*Deselected after consultation with expert group*

	and frustration when they learned that HPV could be contracted even if one had had only one sexual partner in one's lifetime.[8]	behaviour, particularly multiple sex partners.[32]		
HPV targets the moist red or pink tissue known as mucous membrane	HPVs infect epithelial cells in genital mucosa (alphapapillomaviruses only), oral mucosa or skin (representatives of all five genera).[29]	HPVs can infect basal epithelial cells of the skin or inner lining of tissues and are categorized as cutaneous types or mucosal types… Mucosal types infect the lining of the mouth, throat, respiratory tract, or anogenital epithelium.[13 33 34] The New Zealand HPV project http://www.hpv.org.nz/patient-information/hpv-in-perspective Accessed 04/03/2016	One clinical nurse specialist working with head and neck and gynae patients was drafting her own leaflet to answer patients' questions including, "…targets moist pink or red tissue known as mucous membrane."	**10. HPV targets the moist red or pink tissue known as mucous membrane**
Smoking may worsen your prognosis, especially if you continue to smoke after diagnosis.	Current smoking has associated with a significant increased risk of squamous cell carcinoma.[35]	Tobacco use at the time of diagnosis, or tobacco use that continues during treatment in patients with HPV-HNC are independently associated with worse prognosis,[36 37] particularly in response to adjuvant radio-therapy.[38] The biological behaviour of HPV-positive tumours may be altered by tobacco use.[38 39] HPV positive patients should be counselled on the benefits of cessation.[6]	If you are a smoker it is more likely to persist and cause abnormalities and cutting down on smoking can help get rid of the virus. "We strongly emphasise the no smoking every time they come."	**11. Smoking may worsen your prognosis, especially if you continue to smoke after diagnosis.**
There is no need to inform previous partners about your HPV status, and it's up to you whether to tell your current partner.		…there is no evidence to support partner notification of HPV-positive patients or referral for clinical evaluation of their partners. The current ethically acceptable approach to STI testing supports this notion, as notification of partners may cause unnecessary and unethical distress given the absence of clinical standards of treatment. However patients may benefit from having an informed discussion with their partner about their diagnosis, which can foster partner support.[6 19 40] "Long term partners do not appear to be at increased risk of HPV infection, and there is no evidence to support changes in intimate/sexual behaviour with a current partner." [41]	Patients asked who they might have caught it off, do they need to tell them, are they at risk of spreading it? "It's not the same as having an STI like chlamydia or gonorrhea. You don't need to do the contact tracing. It's not the same in that way."	12. **HPV is a sexually transmitted infection but, unlike other STIs, there is no need to inform previous partners about your HPV status. It is up to you whether you tell your current partner.**
It's too late for you or your partner to be vaccinated but it's a good idea for your	Among women aged 15-25 years not previously infected with vaccine type HPV strains, prophylactic HPV vaccination appears to be highly efficacious in preventing HPV	Vaccination has no role for adults who have already been sexually active for a number of years, or someone who has already been infected with HPV and no role in cancer treatment. It is recommended for	Patients are interested to hear about the vaccine, even though it is not immediately relevant to them. They see it as a public health opportunity to help protect	**13. There is no treatment for HPV infection but there's now a vaccination for**

children/ grandchildren	infection and precancerous cervical disease[42]	adolescents and young adults, ideally prior to the onset of sexual activity.[43] The available vaccines cover the HPV genotypes found most commonly in the oral mucosa but their protective effect against oral/oropharyngeal cancer, especially in individuals who have already been exposed to HPV, remains to be demonstrated.[6]	daughters/granddaughters, and wonder about a vaccination for boys. "I would pay for my son to have the vaccination as soon as he is 12/13." "Patients mention about teenage girls having a vaccination – but what about boys? It's giving the wrong message and letting boys off the hook again when they should have responsibility too".	**people aged 9-26. It's a good idea for young people to be vaccinated before they become sexually active.**
HPV can be passed without penetrative sex but it does require intimate physical contact	The primary mode of human papillomavirus (HPV) transmission is through penetrative sex; however, there is evidence of other modes of transmission… Human papillomavirus DNA was detected in the genital tract of female virgins, with prevalence estimates ranging from 0% to 51.1%. HPV transmission from hands to genitals or genitals to hands was reported for both sexes and heterosexual couples.[44]	HPV is transmitted by contact with infected body areas including vaginal, anal and oral sexual behaviours, and possibly "French" kissing. It is not casually transmitted by sharing drinks or kissing on the cheek.[19 20] HPV is sexually transmitted, but penetrative sex is not required for transmission. Skin-to-skin genital contact is a well-recognized mode of transmission.[45]		14. **HPV can be passed without penetrative sex but it does require intimate physical contact**
HPV can be passed by the hands from one intimate part of the body to another	HPV transmission from hands to genitals or genitals to hands was reported for both sexes and heterosexual couples.[44]	HPV is very common and can be transmitted through vaginal and anal sex. However, oral sex, kissing, and genital-to-genital contact or genital-to-hand-to-oral contact can also allow for transmission to occur.[6]		**15. HPV can be passed by the hands from one intimate part of the body to another**
About two thirds of oropharyngeal cancers (which can involve the tonsils, tongue base and soft palate are caused by HPV	…whereas in Europe there was a steady increase in HPV prevalence across all time frames, reaching nearly 50% most recently, in North America HPV prevalence appears to have plateaued over the past decade at about 65%.[46] Overall HPV prevalence in OPC increased significantly over time: from 40.5% (95% CI, 35.1-46.1) before 2000, to 64.3% (95% CI, 56.7-71.3) between 2000 and 2004, and 72.2% (95% CI, 52.9-85.7) between 2005 and 2009 ($p < .001$). Prevalence increased significantly in North America and Europe, and the significant gap between them that existed before 2000 (50.7% vs 35.3%, respectively, $p = .008$) has now	Almost 70% of all tonsillar and oropharyngeal carcinoma cases are HPV-positive in economically developed countries.[48] According to recent data, 3 of 4 newly diagnosed oropharyngeal carcinomas are HPV-positive (HPV+); if current trends continue, HPV+ OPSCC prevalence is expected to overtake that of cervical cancer by the year 2020.[49]	"Head & Neck has become more relevant now that it's been associated with HPV infection and also with better progonosis, so you're giving people potentially useful information."	**16. About two thirds of oropharyngeal cancers (which can involve the tonsils, tongue base and soft palate are caused by HPV**

	disappeared (69.7% vs 73.1%, respectively, p = .8)[47]				
Oral HPV is usually transmitted by oral sex.	Cancer of the oropharynx was associated with having a history of six or more lifetime sexual partners [OR = 1.25, 95% confidence interval (CI) 1.01, 1.54] and four or more lifetime oral sex partners (OR = 2.25, 95% CI 1.42, 3.58). Cancer of the tonsil was associated with four or more lifetime oral sex partners (OR = 3.36, 95 % CI 1.32, 8.53), and, among men, with ever having oral sex (OR = 1.59, 95% CI 1.09, 2.33) and with an earlier age at sexual debut (OR = 2.36, 95% CI 1.37, 5.05). Cancer of the base of the tongue was associated with ever having oral sex among women (OR = 4.32, 95% CI 1.06, 17.6), having two sexual partners in comparison with only one (OR = 2.02, 95% CI 1.19, 3.46) and, among men, with a history of same-sex sexual contact (OR = 8.89, 95% CI 2.14, 36.8).[50]	'The increase in HPV and oral cancers is presumed to be associated with changes in sexual behaviour including oral sex.'[34] 'Oral HPV infection and/or OPC are not markers of sexual promiscuity or abnormality. Oral sex is a normal sexual activity; in the US, 80%of sexually active people between 15-44 have had oral sex with an opposite sex partner (CDC fact sheet), whereas in the UK >70% aged 16-44 reported oral sex with an opposite sex partner in the last year.'[51] 'Affected patients want answers to questions that clinicians may find difficult to answer, because these questions often fall far outside the remit of traditional consultations held in head and neck clinics.'[5]	We usually start by saying this has been caused in the past by smoking and drinking related factors, but now we're finding over the past few years that this is actually caused by a sexually transmitted virus. It is important to publicise that oropharyngeal cancers can be caused by oral sex. This is a very sensitive topic. [Patients ask,] "I have never smoked – why have I got this?" "HPV is usually transmitted to the mouth by close sexual contact." "If the couple haven't engaged in oral sex, then it could be from a past relationship – this can be awkward." "She had 2 patients – one said he felt vulgar, embarrassed about his lifestyle and it made him feel dirty and the other said the same."	**17.**	**Oral HPV infection can be transmitted by oral sex as well as other forms of close sexual contact**
There is some evidence that HPV can be transmitted by "deep" or "French" kissing.		Oral sex and open-mouthed kissing are associated with the development of oral HPV infection.[52] "Can you get it… You know, just from kissing someone?"[28] '…baseline oral HR HPV status was significantly predicted by the spouse's oral HR HPV status at baseline … Here, we found that oral sex habits did not predict the outcome of oral HPV of either spouse …these results suggest that the oral-to-oral route might be an important mode of HPV transmission.'[23] Some people with oral HPV infection report never having performed oral sex.[5 52 53] Autoinoculation from male genitals to oral cavity is a possible route of transmission.[54] It is also possible that HPV can be transmitted by deep kissing but data are currently inconclusive.[52-56] Modes of transmission that have been proposed include kissing, other mouth-to-mouth contact, autoinfection, and perinatal contact.[57]	Clinicians are concerned that their patients worry about transmitting HPV to their wife/husband/children. They ask that if it is in their mouth, is it something they can transfer from kissing? "Having one relationship, even a kiss, not even a sexual relationship, could result in transmission. How can you tell a whole generation of people that they can't kiss, even though you might be able to tell them not to be promiscuous, you can't tell them not to fondle or kiss."	**18.**	**There is some evidence that HPV may be transmitted by "deep" or "French" kissing but there is no evidence of transmission by sharing drinks or kissing on the cheek**

You have a better prognosis if you have HPV because this type of cancer responds better to treatment [Head and neck cancers only]		Patients with HPV-positive high grade non-squamous cell carcinoma had a lower risk of dying and a lower risk of recurrence that HPV-negative HNSCC patients. This review suggests that there is an improved overall and disease free survival for patients with HPV-positive tumours, but that this effect may be site specific to cancers of the oropharynx.[58] Both progression-free survival and disease-free survival were significantly improved in HPV-positive HNSCCs. HPV-positive HNSCCs and OPSCCs patients have a significantly lower disease specific mortality and are less likely to experience progression or recurrence of their cancer than HPV-negative patients; findings which have connotations for treatment selection in these patients.[59]	"Once I knew they were looking for [HPV] and that it would be beneficial for me, I hoped that I would have it"[28] HPV positivity is inversely associated with molecular markers of poor prognosis,[60 61] significantly reduced risk of recurrence,[62] and improved disease-free and progression-free survival.[39 59 63] HPV-HNC responds better to primary surgical therapy,[64] adjuvant radiotherapy[65] and/or chemo-radiotherapy protocols.[66 67] Be positive – "We think your cancer is related to a viral infection which is good news"[5] HPV-related OPC has a much better prognosis than non-HPVOPC. It is associated with a better response to treatment resulting insignificantly reduced risk of recurrence and improved disease-free and progression-free survival, as well as a significant reduction in disease-specific mortality.[19 20 43]	"People with this tend to react better to treatment."	**19. You are likely to have a better outcome if your cancer has been caused by HPV because HPV-driven cancers respond better to treatment than other cancers. [Head and neck cancers only.]**
If you have HPV, your partner is likely to have HPV too. There is no way to know who gave it to whom.*	This was a particularly important point for women who were HPV positive; they feared they would be thought to have been unfaithful, feared their partner had been once their HPV status was identified. (interviews with women in the UK cervical screening programme)	--- Some women understood that the transmission of HPV could have occurred prior to their present relationship – thus making it difficult to determine whether any infidelity had occurred.[8]	The majority …felt uninformed about whether precautions should be taken to safeguard their partner from HPV.[68] It is impossible to know for certain from whom or when one initially acquired HPV because most people do not know they have it.[6] Partners who have been together tend to share HPV. This means the partner likely has HPV already. There is no way to know if the partner gave the patient HPV or vice versa. Because HPV is a common virus and is usually acquired early in life, having an HPV infection does not imply infidelity. It is important to remember that there should be no shame or blame associated with a diagnosis of HPV.[6]	This causes distress among patients. Many wonder whether their partner has been unfaithful (especially if they have had been with the same partner for a long time). "Patient's wife has cervical cancer and he is convinced she gave it to him. I explain that it could be either way." "The wife was so stressed out because she thought she had caused her husband's cancer…and another couple where the wife was distraught because she thought it was due to her husband being unfaithful to her." "Even if they have an open and honest relationship with their partner, you still have that culture of blame of how has it happened, have they been sleeping with somebody else."	*Deselected after consultation with expert group* *Content overlaps with message 8*
Partners of patients with HPV-related cancers may be at slightly increased risk, but these are still rare			Partners of patients with HPV-OSCC may have slightly higher rates of HPV-associated cancers such as anal, penile cervical and/or oropharyngeal than the general population, but these are still rare cancers and the	There are many worries from patients about passing on HPV. "Don't worry about your kids, you're not going to spread it"	*Deselected after consultation with expert group*

cancers and the risk is low		chances of developing these cancers remain low overall.[19] Persistent oral HPV infection of the spouse increased the risk of persistent oral infection 10-fold in the other spouse.[23] "simple transmission may not be sufficient to lead to cancer and other factors related to genetics, immune function, other STIs and infections, promiscuity, and multiple sexual partners may come into play in progression from infections to cancer… the vast majority of partners of patients with HPVOPC never develop either oropharyngeal or cervical cancer."[6] Long term partners do not seem to be at risk of HPV infection.[5]	"They wonder if they can give it to their wife/husband/children. They ask that if it is in their mouth, is it something they can transfer from kissing."	
There is no need to change your behaviour but your partner might find regular *oral examinations by a dentist/ cervical screening* reassuring.		Couples who have been together for several years have likely already shared whatever infections they have, and no changes in their physical intimacy are needed.[69] … currently no evidence to suggest behaviour modification… no recommendation for use of prophylactic HPV vaccines… partners may find it reassuring to undergo periodic surveillance[20] Couples that have been intimate have likely already exposed each other to their sexual infections. Therefore, we do not recommend changing current sexual behaviours in established relationships… Partners of patients with HPV-OSCC may have slightly higher rates of HPV-associated cancers… but these are still rare cancers and the chances of developing these cancers remain low overall.[19] Long term partners do not appear to be at increased risk of HPV infection, and there is no evidence to support changes in intimate/sexual behaviour with a current partner.[41] …persistent oral HPV infection in partners may increase the risk of developing oral		*Deselected after consultation with expert group*

			cancer. It is recommended that these individuals use regular dental appointments as important tools for detecting any high-risk HPV-related changes in the oral and oropharyngeal mucosa.[6] Female partners should undergo routine cervical screening according to current guidelines.[70]		
If he/she is a smoker, stopping smoking will reduce your partner's risk of developing HPV-associated cancer.			A clear dose-response relationship exists between the intensity and duration of tobacco exposure and individual risk of developing HNC.[20] Behavioural modification, such as cessation of alcohol and tobacco use, should be encouraged because they are not only health-enhancing strategies but have been found to significantly decrease the odds of oral HPV persistence.[6 21]		*Deselected after consultation with expert group*
HPV vaccination also provides some protection against other cancers such as *penile, vulvar, vaginal, anal and head and neck*.	Women interviewed in the context of cervical screening questioned whether cancers other than cervical cancer can be caused by HPV, particularly whether men are more at risk from other HPV related cancers.	40% of vulvar, 60% of vaginal and 80% of anal carcinoma may be avoided by prophylactic vaccines against HPV 16/18[16] Oral infection with HPV is a significant independent risk factor for oral squamous cell carcinoma.[11] --- Some participants questioned whether HPV can cause other cancers.[8]		The media publicity related to the vaccination programme has been useful to start people talking. "Tells them about the vaccination programme for young girls to reduce cervical cancer – and she would definitely vaccinate boys as well as HPV is implicated in so many cancers".	*Deselected after consultation with expert group*
This is the same cancer that Michael Douglas had			Suggested response to questions about MD: "Yes, Michael Douglas also had an HPV-related cancer and has done very well. Yet everyone's cancer is different and a personalised plan for the treatment of your specific cancer will be put together to achieve the highest cure rate with the least morbidity."[43]	Patients don't seem to be aware of HPV as such, but will ask if this is sexually transmitted like Michael Douglas. "Useful publicity to get people talking."	*Deselected after consultation with expert group*
Nearly all anal cancers are caused by HPV		This review provides evidence that anal HPV infection and dysplasia are common in women… The incidence of anal cancer continues to grow in all women, especially those living with HIV.[71]	In anal cancers, HPV-DNA is detected in 88–94%.[13] High-risk human papillomavirus (HPV) types can be detected in 80-90% of all anal SCC cases, making it second only to cervical cancer in the closeness of its association with this virus. HPV-16 can be detected in ~90% of HPV-positive cases of anal SCC.[72]	" in anal cancer is it useful to give information around this as standard or are we just raising another issue which doesn't really help them?"	**20. Nearly all anal cancers are caused by HPV**

		HPV has been detected in… 80-90% of anal cancers, with HR HPV types 16 or 18 detected in about 70% of cervical and 80% of anal cancers.[73] Current data indicate that HPV infection is potentially associated with 90%–93% of anal cancers[74]		
Anal HPV can be transmitted by anal sex or by hand transmission or intimate skin-to-skin contact		HPV is sexually transmitted, but penetrative sex is not required for transmission. Skin-to-skin genital contact is a well-recognized mode of transmission.[45] Among men who were not exclusively heterosexual and women, receptive anal intercourse was related strongly to the risk of anal cancer (OR, 6.8 [95% CI, 1.4 –33.8] and OR, 2.2 [95% CI, 1.4 –3.3], respectively).[75] Sixteen events involved transmission between different genital sites, 2 involved anal-to-genital transmission, and 3 involved genital-to-hand transmission…. Among the 5 couples with penis to-anus transmission, 4 reported anal intercourse during the corresponding time period…. Sexual transmission also involved the scrotum, the anus of women, and the hands of both sexes…. Transmission through nonpenetrative sexual contact was demonstrated between the female anus and the scrotum, as well as the female hand and male genitals. [76]	Some clinicians find this topic difficult to discuss with patients. Patients worried about stigma related to anal sex and what the clinician might think of them. It can be problematical with partners being present at a consultation. "Obviously there is the topic of homosexuality and I find it quite difficult to ask if they have had anal intercourse, but having said that I don't routinely ask the women because I find that difficult as well." "Whereas more historically with cervix cancer it is associated with a virus, can be associated with sexual contact – it's within the vagina, that's normal sexual practice and therefore I'm normal and it's nothing that will have stigma attached to it, whereas those with an anal cancer may feel there is an element of stigma." "He has had one patient with tumours and who has had repeated tumours and been tested for HPV (positive) and is adamant that this is not related to anal intercourse and is quite bitter and angry…so they just leave it."	**21. Anal HPV can be transmitted by anal sex or by hand transmission or intimate skin-to-skin contact**
In women it is easy for HPV to be transferred between the genital and the anal area		HPV is sexually transmitted, but penetrative sex is not required for transmission. Skin-to-skin genital contact is a well-recognized mode of transmission.[45]	Men and women need different information. "He tells the women they have cancer and about treatment and follow up, which includes vaginal examinations so explains that the two things can be linked and they are at slightly increased risk." "I think you could possibly do with separate literature for men and women. We need to be careful as the one thing that does upset people, especially the women, is if they are	**22. In women it is easy for HPV to be transferred between the genital and the anal area**

			lumped in a group with HIV positive homosexual men or drug addicts."	
You can't get cervical cancer without having HPV first	The strength of the association between HPV persistence and cervical neoplasia increased with increasing grade of cervical disease. This trend supports the view that CIN 1 represents active, mainly transient HPV infection and has high rates of occurrence and regression among sexually active women. In contract, long-term HPV positivity is clearly associated with neoplastic transformation.[18]	About 1000 women with histologically verified invasive cervical cancer were recruited from 22 countries around the world…. HPV-DNA was detected in 99.7% of the tumors, leading to the conclusion that HPV is a necessary cause of cervical cancer.[13]	"You can't get cervical cancer without having it first." "Cervical cancer and abnormalities of the cervix are generally related to the HPV virus."	**23. You can't get cervical cancer without having HPV first**
Nearly half of vulvar and two thirds of vaginal cancers are caused by HPV	'…HPV appears to be present in 65%-75% of vulvar and vaginal squamous cell cancers.'[77]	Between 64 and 91% of vaginal cancers and 82 and 100% of VAIN-3 lesions are HPV-DNA positive.[13] Cancers of the vulva and of the penis have been associated to HPV. The tumors diagnosed in young individuals are usually of histological types called basaloid or warty; the majority (60–90%) are positive for HPV and their pre-neoplastic lesions are also strongly associated with HPV.[13] Current data indicate that HPV infection is potentially associated with… 40%–64% of vaginal cancers, and 40%–51% of vulvar cancers.[74]		**24. Nearly half of vulvar and two thirds of vaginal cancers are caused by HPV**

References

1. Revzina NV, Diclemente RJ. Prevalence and incidence of human papillomavirus infection in women in the USA: a systematic review. *Int J STD AIDS* 2005;16(8):528-37.
2. Bruni L, Diaz M, Castellsague X, Ferrer E, Bosch FX, de Sanjose S. Cervical Human Papillomavirus Prevalence in 5 Continents: Meta-Analysis of 1 Million Women with Normal Cytological Findings. *J Infect Dis* 2010;202(12):1789-99.
3. Hendry M, Lewis R, Clements A, Damery S, Wilkinson C. "HPV? Never heard of it!": A systematic review of girls' and parents' information needs, views and preferences about human papillomavirus vaccination. . *Vaccine* 2013;31:5152-67.
4. Olbrys KM. Effect of patient education on postcolposcopy follow-up. *Clinical Nursing Research* 2011;20(2):209-20.
5. Evans M, Powell NG. Sexual health in oral oncology: breaking the news to patients with human papillomavirus-positive oropharyngeal cancer. *Head and Neck* 2014;36:1529-33.
6. Chu A, Genden E, Posner M, Sikora A. A Patient-Centered Approach to Counseling Patients With Head and Neck Cancer Undergoing Human Papillomavirus Testing: A Clinician's Guide. *Oncologist* 2013;18(2):180-89.
7. Dunne EF, Nielson CM, Stone KM, Markowitz LE, Giuliano AR. Prevalence of HPV infection among men: A systematic review of the literature. *J Infect Dis* 2006;194(8):1044-57.

8. Hendry M, Pasterfield D, Lewis R, Clements A, Damery S, Neal RD, et al. Are women ready for the new cervical screening protocol in England? A systematic review and qualitative synthesis of views about human papillomavirus testing. *Br J Cancer* 2012;107:243-54.
9. Hobbs CGL, Sterne JAC, Bailey M, Heyderman RS, Birchall MA, Thomas SJ. Human papillomavirus and head and neck cancer: a systematic review and meta-analysis. *Clin Otolaryngol* 2006;31(4):259-66.
10. Kreimer AR, Clifford GM, Boyle P, Franceschi S. Human papillomavirus types in head and neck squamous cell carcinomas worldwide: A systemic review. *Cancer Epidemiology Biomarkers and Prevention* 2005;14(2):467-75.
11. Miller CS, Johnstone BM. Human papillomavirus as a risk factor for oral squamous cell carcinoma: a meta-analysis, 1982-1997.[see comment]. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2001;91(6):622-35.
12. Rees L, Birchall M, Bailey M, Thomas S. A systematic review of case-control studies of human papillomavirus infection in laryngeal squamous cell carcinoma. *Clin Otolaryngol Allied Sci* 2004;29(4):301-6.
13. Munoz N, Castellsague X, Berrington de Gonzalez A, Gissmann Lutz. Chapter 1: HPV in the etiology of human cancer. *Vaccine* 2006;24(Supplement 3):S3/1-10.
14. Parkin DM, Bray F. Chapter 2: The burden of HPV-related cancers. *Vaccine* 2006;24(Suppl 3):S3/11–S3/25.
15. World Health Organisation/ICO Information Centre on HPV and Cervical Cancer (HPV Information Centre). Human Papillomavirus and Related Cancers in World. Summary Report 2010.
16. De Vuyst H, Clifford GM, Nascimento MC, Madeleine MM, Franceschi S. Prevalence and type distribution of human papillomavirus in carcinoma and intraepithelial neoplasia of the vulva, vagina and anus: a meta-analysis. *Int J Cancer* 2009;124(7):1626-36.
17. Guan P, Howell-Jones R, Li N, Bruni L, S dS, Franceschi S, et al. Human papillomavirus types in 115,789 HPV-positive women: A meta-analysis from cervical infection to cancer. *Int J Cancer* 2012;131(10):2349–59.
18. Koshiol J, Lindsay L, Pimenta JM, Poole C, Jenkins D, Smith JS. Persistent human papillomavirus infection and cervical neoplasia: a systematic review and meta-analysis. *Am J Epidemiol* 2008;168(2):123-37.
19. Fakhry C, D'Souza G. Discussing the diagnosis of HPV-OSCC: Common questions and answers. *Oral Oncol* 2013;49(9):863-71.
20. Finnigan JP, Sikora AG. Counseling the Patient with Potentially HPV-Related Newly Diagnosed Head and Neck Cancer. *Curr Oncol Rep* 2014;16(3).
21. D'Souza G, Fakhry C, Sugar EA, Seaberg EC, Weber K, Minkoff HL, et al. Six-month natural history of oral versus cervical human papillomavirus infection. *Int J Cancer* 2007;121(1):143-50.
22. Holowaty P, Miller AB, Rohan T, To T. Natural History of Dysplasia of the Uterine Cervix *J Natl Cancer Inst* 1999;91(3):252-58.
23. Rintala F, Grenman S, Puranen M, Syrjanen S. Natural history of oral papillomavirus infections in spouses: a prospective Finnish HPV family study. *J Clin Virol* 2006;359(11):1143-54.
24. Manhart LE, Koutsky LA. Do condoms prevent genital HPV infection, external genital warts, or cervical neoplasia? A meta-analysis. *Sex Transm Dis* 2002;29(11):725-35.
25. Franco E, Villa L, Sobrinho J, Prado J, Rousseau M-C, Desy M, et al. Epidemiology of Acquisition and Clearance of Cervical Human Papillomavirus Infection in Women from a High-Risk Area for Cervical Cancer. *The Journal of Infectious Diseases* 1999;180(5):1415-23.
26. Munoz N, Mendez F, Posso H, Molano M, van den Brule AJC, Ronderos M, et al. Incidence, Duration, and Determinants of Cervical Human Papillomavirus Infection in a Cohort of Colombian Women with Normal Cytological Results. *J Infect Dis* 2004;190(12):2077-87.
27. Woodman CB, Collins S, Winter H, Bailey A, Ellis J, Prior P, et al. Natural history of cervical human papillomavirus infection in young women: a longitudinal cohort study. *Lancet* 2001;357(9271):1831-6.
28. Baxi SS, Shuman AG, Corner GW, Shuk E, Sherman EJ, Elkin EB, et al. Sharing a diagnosis of HPV-related head and neck cancer: The emotions, the confusion, and what patients want to know. *Head Neck-J. Sci. Spec. Head Neck* 2013;35(11):1534-41.

29. Bzhalava D, Guan P, Franceschi S, Dillner J, Clifford G. A systematic review of the prevalence of mucosal and cutaneous human papillomavirus types. *Virology* 2013;445:224-31.
30. D'Souza G, Kreimer AR, Viscidi R, Pawlita M, Fakhry C, Koch WM, et al. Case-control study of human papillomavirus and oropharyngeal cancer. *N Engl J Med* 2007;356:1944-56.
31. Burchell AN, Winer RL, de Sanjose S, Franco EL. Chapter 6: Epidemiology and transmission dynamics of genital HPV infection. *Vaccine* 2006;24 Suppl 3:S3/52-61.
32. Koutsky L. Epidemiology of genital human papillomavirus infection. *Am J Med* 1997;102(5A):3-8.
33. Burd EM. Human Papillomavirus and Cervical Cancer. *Clin Microbiol Rev* 2003;16(1):1-17.
34. Cubie HA. Diseases associated with human papillomavirus infection. *Virology* 2013;445:21-34.
35. de Gonzalez AB, Sweetland S, Green J. Comparison of risk factors for squamous cell and adenocarcinomas of the cervix: a meta-analysis. *Br J Cancer* 2004;90(9):1787-91.
36. Hafkamp HC, Manni JJ, Haesvoets A, Voogd AC, Schepers M, NBot FJ, et al. Marked differences in survival rate between smokers and nonsmokers with HPV 16-associated tonsillar carcinomas. *Int J Cancer* 2008;122(12):2656-64.
37. Mayne ST, Cartmel B, Kirsh V, Goodwin Jr WJ. Alcohol and tobacco use prediagnosis and postdiagnosis, and survival in a cohort of patients with early stage cancers of the oral cavity, pharynx and larynx. *Cancer Epidemiology Biomarkers and Prevention* 2009;18(12):3368-74.
38. Gillison ML, Zhang Q, Jordan R, Xiao W, Westra WH, Trotti A, et al. Tobacco smoking and increased risk of death and progression for patients with p16-positive and p16-negative oropharyngeal cancer. *J Clin Oncol* 2012;30(17):2102-11.
39. Ang KK, Harris J, Wheeler R, Weber R, Rosenthal DI, Nguyen-Tan PF, et al. Human Papillomavirus and survival of patients with oropharyngeal cancer. *N Engl J Med* 2010;363(1):24-35.
40. Field N, Tantern C, Mercer CH, Nicholson S, Soldan K, Beddows S, et al. Testing for sexually transmitted infections in a population-based sexual health survey: Development of an acceptable ethical approach. *J Med Ethics* 2012;38:380-82.
41. Powell NG, Evans M. Human papillomavirus-associated head and neck cancer: Oncogenic mechanisms, epidemiology and clinical behaviour. *Diagnostic Histopathology* 2015;21(2):49-64.
42. Rambout L, Hopkins L, Hutton B, D. F. Prophylactic vaccination against human papillomavirus infection and disease in women: A systematic review of randomized controlled trials. l 2007;177(5):469-79. *Canadian Medical Association Journal* 2007;177(5):469-79.
43. Deschler DG, Richmon JD, Khariwala SS, Ferris RL, Wang MB. The "New" Head and Neck Cancer Patient-Young, Nonsmoker, Nondrinker, and HPV Positive: Evaluation. *Otolaryngol. Head Neck Surg.* 2014;151(3):375-80.
44. Liu Z, Rashid T, Nyitray AG. Penises not required: a systematic review of the potential for human papillomavirus horizontal transmission that is non-sexual or does not include penile penetration. *Sex Health* 2015;13(1):10-21.
45. World Health Organisation Media Centre. Human papillomavirus (HPV) and cervical cancer. Fact sheet No380, 2015.
46. Stein AP, Saha S, Kraninger JL, Swick AD, Yu M, Lambert PF, et al. Prevalence of Human Papillomavirus in Oropharyngeal Cancer: A Systematic Review. *Cancer* 2015;21(3):138-46.
47. Mehanna H, Beech T, Nicholson T, El-Hariry I MC, Paleri V, Roberts S. Prevalence of human papillomavirus in oropharyngeal and nonoropharyngeal head and neck cancer--systematic review and meta-analysis of trends by time and region. *Head Neck* 2013;35(5):747-55.
48. Haedicke J, Iftner T. Human papillomaviruses and cancer. *Radiother Oncol* 2013;108:397-402.
49. Moore KA, Mehta V. The Growing Epidemic of HPV-Positive Oropharyngeal Carcinoma: A Clinical Review for Primary Care Providers. *Journal of the American Board of Family Medicine* 2015;28(4):498-503.
50. Heck JE, Berthiller J, Vaccarella S, Winn DM, Smith EM, Shan'gina O, et al. Sexual behaviours and the risk of head and neck cancers: a pooled analysis in the International Head and Neck Cancer Epidemiology (INHANCE) consortium. *Int J Epidemiol* 2010;39(1):166-81.

51. Mercer CH, Tanton C, Prah P, Erens B, Sonnenberg P, Clifton S, et al. Changes in sexual attitudes and lifestyles in Britain through the lifecourse and over time: findings from the National Surveys of Sexual Attitudes and Lifestyles (Natsal). *Lancet Oncol* 2013;382:1781-94.
52. D'Souza G, Agrawal Y, Halpern J, Bodison S, Gillison ML. Oral sexual behaviours associated with prevalent oral human papillomavirus infection. *J Infect Dis* 2009;199:1263-69.
53. Gillison ML, Broutian T, Pickard RKL, Tong Z-y, Xiao W, Kahle L, et al. Prevalence of oral HPV infection in the United States, 2009-2010. *Jama* 2012;307(7):693-703.
54. Edelstein ZR, Schwarz SM, Hawes S, Hughes JP, Feng Q, Stern ME, et al. Rates and determinants of oral human papillomavirus infection in young men. *Sex Transm Dis* 2012;39:860-67.
55. Pickard RK, Xiao W, Broutian TR, He X, Gillison ML. The prevalence and incidence of oral human papillomavirus infection among young men and women, aged 18-30 years. *Sex Transm Dis* 2012;39:559-66.
56. Smith EM, Swarnavel S, Ritchie JM, Wang D, Haugen TH, Turek LP. Prevalence of human papillomavirus in the oral cavity/oropharynx in a large population of children and adolescents. *The pediatric infectious disease journal* 2007;26:836-40.
57. Gillison ML. Human papillomavirus-related diseases: oropharynx cancers and potential implications for adolescent HPV vaccination. *J Adolesc Health* 2008;43(4 Suppl):S52-60.
58. Ragin CCR, Taioli E. Survival of squamous cell carcinoma of the head and neck in relation to human papillomavirus infection: review and meta-analysis. *Int J Cancer* 2007;121(8):1813-20.
59. O'Rorke MA, Ellison MV, Murray LJ, Moran M, James J, Anderson LA. Human papillomavirus related head and neck cancer survival: a systematic review and meta-analysis. *Oral Oncol* 2012;48(12):1191-201.
60. Poeta ML, Manola J, Goldwasser MA, Forastiere A, Benoit N, Califano JA, et al. TP53 mutations and survival in squamous-cellcarcinoma of the head and neck. *N Engl J Med* 2007;357(25):2552-61.
61. Westra WH, Taube JM, Poeta ML, Begum S, Sidransky D, Koch WM. Inverse relationship between human papillomavirus-16 infection and disruptive p53 gene mutations in squamous cell carcinoma of the head and neck. *Clin Cancer Res* 2008;14(2):366-9.
62. Jiain KS, Sikora AG, Baxi SS, Miorris LG. Synchronous cancers in patients with head and neck cancer: risks in the era of human papillomavirus-associated oropharyngeal cancer. *Cancer* 2013;119(10):1832-7.
63. Reimers N, Kasper HU, Weissenborn SJ, Stutzer H, Preuss SF, Hoffmann TK, et al. Combined analysis of HPV-DNA, p16 and EGFR expression to predict prognosis in oropharyngeal cancer. *Int J Cancer* 2007;120(8):1731-8.
64. Licitra L, Perrone F, Bossi P, Suardi S, Mariani L, Artusi R, et al. High-risk human papillomavirus affects prognosis in patients with surgically treated oropharyngeal squamous cell carcinoma. *J Clin Oncol* 2006;24(36):5630-6.
65. Lindel K, Beer KT, Laissue J, Greiner RH, Aebersold DM. Human papillomavirus positive squamous cell carcinoma of the oropharynx: a radiosensitive subgroup of head and neck carcinoma. *Cancer* 2001;92(4):805-13.
66. de Jong MC, Pramana J, Knegjens JL, Balm AJM, van den Brekel MWM, Hauptmann M, et al. HPV and high-risk gene expression profiles predict response to chemoradiotherapy in head and neck cancer, independent of clinical factors. *Radiother Oncol* 2010;95(3):365-70.
67. Posner MR, Lorch JH, Goloubeva O, Tan M, Schumaker LM, Sarlis NJ, et al. Survival and human papillomavirus in oropharynx cancer in TAX 324: a subset analysis from an international phase III trial. *Ann Oncol* 2011;22(5):1071-7.
68. Milbury K, Rosenthal DI, El-Naggar A, Badr H. An exploratory study of the informational and psychosocial needs of patients with human papillomavirus-associated oropharyngeal cancer. *Oral Oncol* 2013;49(11):1067-71.
69. D'Souza G, Gross ND, Pai SI, Haddad RI, Gillison ML, Posner M. Oral HPV infection in HPV-positive oropharyngeal cancer cases and their spouses. *J Clin Oncol* 2013;31:ASCO presentation: CRA6031.

70. Reiter PL, McRee A-L, Gottlieb SL, Brewer NT. HPV vaccine for adolescent males: acceptability to parents post-vaccine licensure. *Vaccine* 2010;28(38):6292-7.
71. Stier EA, Sebring MC, Mendez AE, Ba FS, Trimble DD, EY C. Prevalence of anal human papillomavirus infection and anal HPV-related disorders in women: a systematic review. *Gynecology* 2015;213(3):278-309.
72. Grulich AE, Poynten IM, Machalek DA, Jin F, Templeton DJ, Hillman RJ. The epidemiology of anal cancer. *Sex Health* 2012;9(6):504-08.
73. Abramowitz L, Jacquard AC, Jaroud F, Haesebaert J, Siproudhis L, Pradat P, et al. Human papillomavirus genotype distribution in anal cancer in France: the EDiTH V study. *Int J Cancer* 2011;129:433-39.
74. Chaturvedi AK. Beyond Cervical Cancer: Burden of Other HPV-Related Cancers Among Men and Women. *Jurnal of Adolescent health* 2010;46(4 Supplement):S20-S26.
75. Daling JR, Madeleine MM, Johnson JG, Schwartz SM, Shera KA, Wurscher MA, et al. Human Papillomavirus, Smoking, and Sexual Practices in the Etiology of Anal Cancer. *Cancer* 2004;101(2):270-80.
76. Hernandez BY, Wilkens LR, Zhu X, Thompson P, McDuffie K, Shvetsov YB, et al. Transmission of Human Papillomavirus in Heterosexual Couples. *Emerging infectious diseases* 2008;14(6):888-94.
77. Insinga RP, Liaw K-L, Johnson LG, MM M. A Systematic Review of the Prevalence and Attribution of Human papillomavirus Types Among Cervical, Vaginal and Vulvar Precancers and Cancers in the United States. *Cancer Epidemiol Biomarkers Prev.* 2008;17(7):1611-22.